Installation Wiring

AMBIRAD SmartCom³

SmartCom³ Control Panel & Nor-Ray-Vac Radiant System.

Section

Wiring Diagrams

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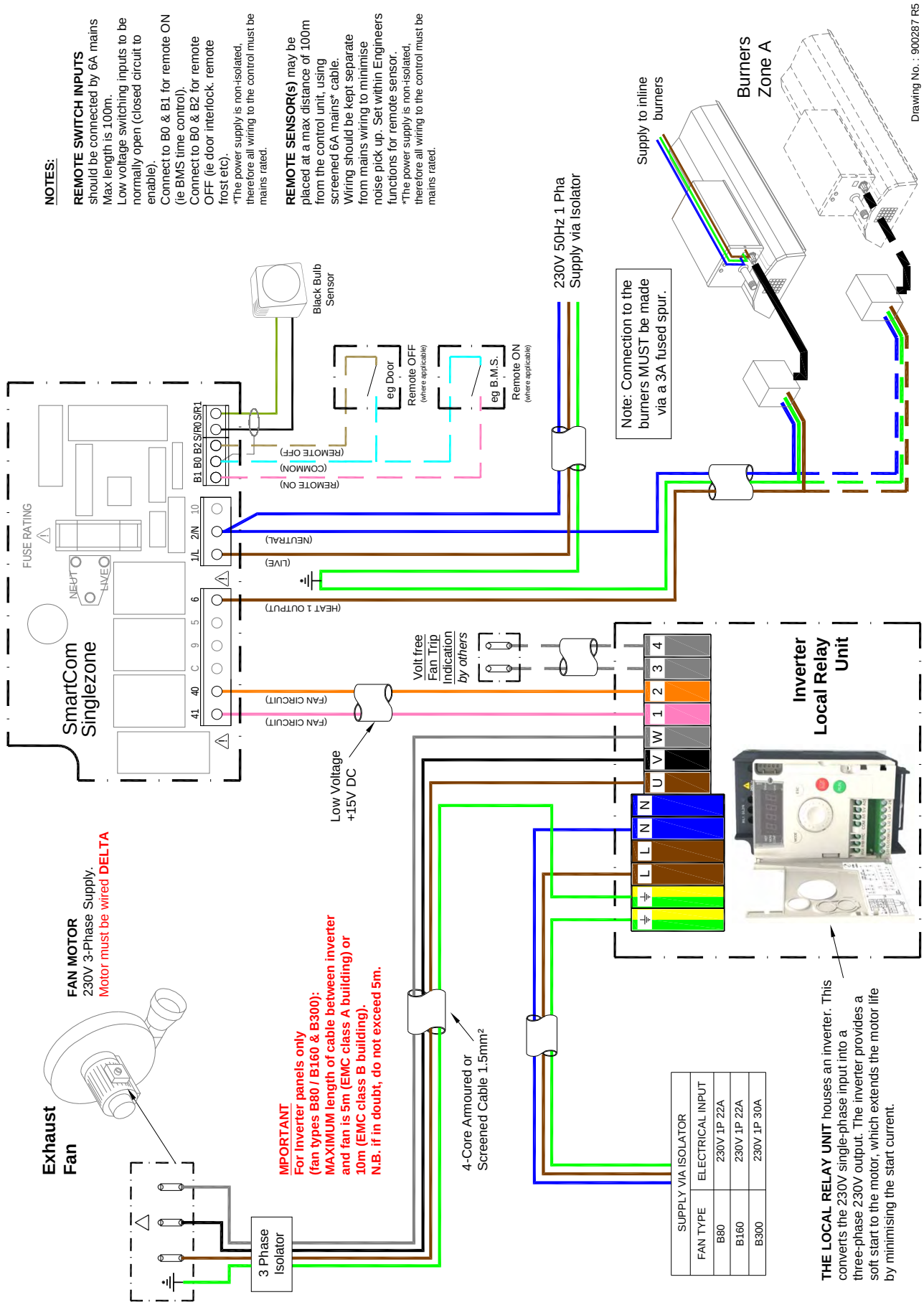
Warnings

All external wiring MUST comply with the current IEE wiring regulations. These instruction MUST be used in conjunction with the SmartCom³ user manual and the Nor-Ray-Vac O&M instruction manual.

Visit our Support Database at www.s-i-d.co.uk

1 Single Zone B80, B160, B300 Fan Systems.


NOTES:
REMOTE SWITCH INPUTS should be connected by 6A mains Max length is 100m. Low voltage switching inputs to be normally open (closed circuit to enable). Connect to B0 & B1 for remote ON (ie BMS time control). Connect to B0 & B2 for remote OFF (ie door interlock. remote frost etc). *The power supply is non-isolated, therefore all wiring to the control must be mains rated.
REMOTE SENSOR(s) may be placed at a max distance of 100m from the control unit, using screened 6A mains* cable. Wiring should be kept separate from mains wiring to minimise noise pick up. Set within Engineers functions for remote sensor. *The power supply is non-isolated, therefore all wiring to the control must be mains rated.
Drawing No. : 900287 R5
Burners Zone A
Supply to inline burners
Note: Connection to the burners MUST be made via a 3A fused spur.
230V 50Hz 1 Pha Supply via Isolator
Black Bulb Sensor
eg Door
Remote OFF (where applicable)
eg B.M.S.
Remote ON (where applicable)
SmartCom Singlezone
FUSE RATING
NEUT
LIVE
B1 B0 B2 S/R0 S/R1
(REMOTE OFF)
(COMMON)
(REMOTE ON)
1/L 2/N 10
(NEUTRAL)
(LIVE)
6
(HEAT 1 OUTPUT)
41 40 C 9 5 6
(FAN CIRCUIT)
(FAN CIRCUIT)
Volt free Fan Trip Indication by others
Low Voltage +15V DC
Inverter Local Relay Unit
U V W 1 2 3 4
N N L L
FAN MOTOR
230V 3-Phase Supply.
Motor must be wired DELTA
Exhaust Fan
MPORTANT
For inverter panels only
(fan types B80 / B160 & B300):
MAXIMUM length of cable between inverter and fan is 5m (EMC class A building) or 10m (EMC class B building).
N.B. if in doubt, do not exceed 5m.
4-Core Armoured or Screened Cable 1.5mm²
3 Phase Isolator
SUPPLY VIA ISOLATOR
FAN TYPE
ELECTRICAL INPUT
B80
230V 1P 22A
B160
230V 1P 22A
B300
230V 1P 30A
THE LOCAL RELAY UNIT houses an inverter. This converts the 230V single-phase input into a three-phase 230V output. The inverter provides a soft start to the motor, which extends the motor life by minimising the start current.

NOTES:

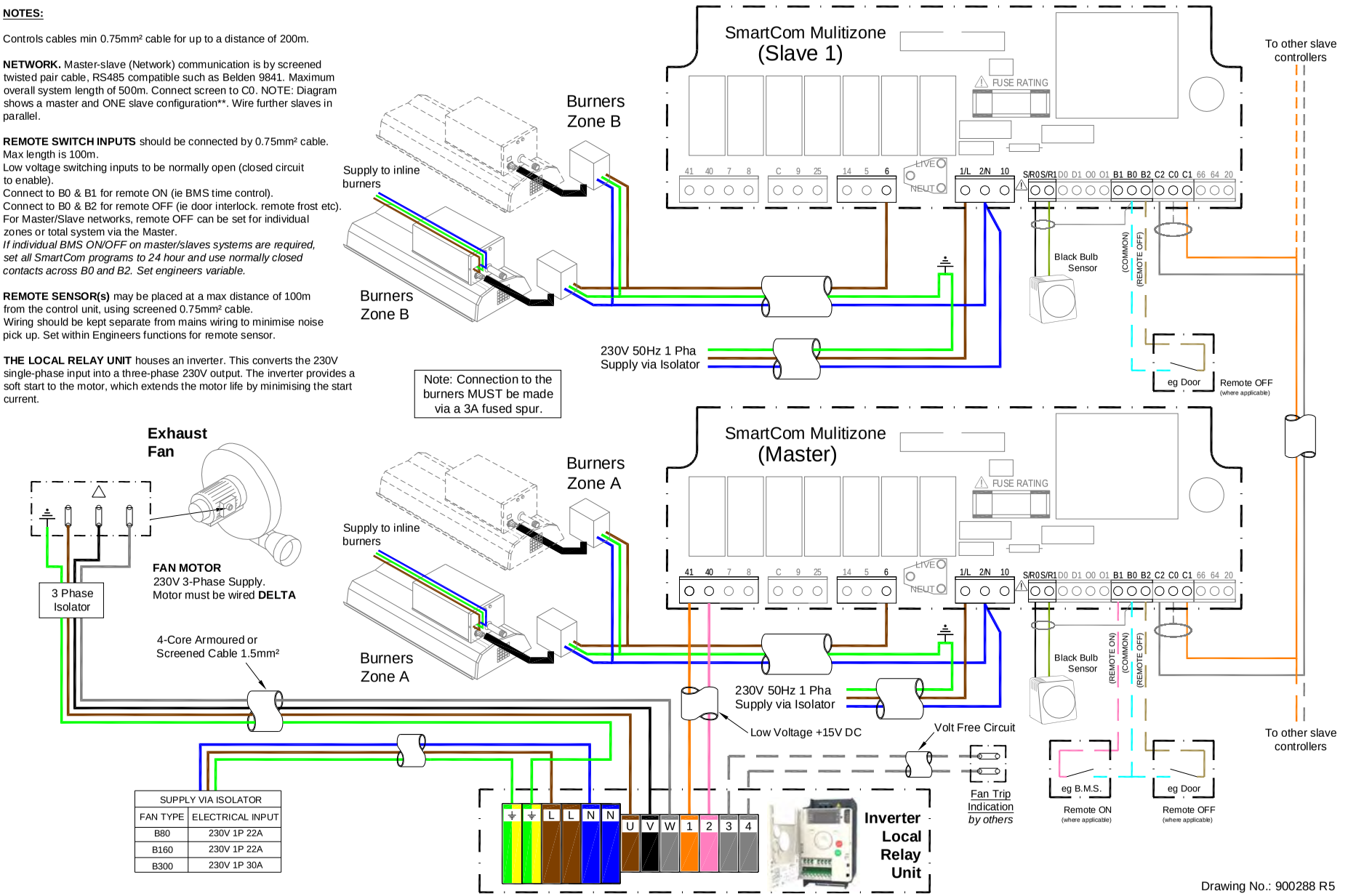
Controls cables min 0.75mm² cable for up to a distance of 200m.

NETWORK. Master-slave (Network) communication is by screened twisted pair cable, RS485 compatible such as Belden 9841. Maximum overall system length of 500m. Connect screen to C0. NOTE: Diagram shows a master and ONE slave configuration**. Wire further slaves in parallel.

REMOTE SWITCH INPUTS should be connected by 0.75mm² cable. Max length is 100m.
Low voltage switching inputs to be normally open (closed circuit to enable).
Connect to B0 & B1 for remote ON (ie BMS time control).
Connect to B0 & B2 for remote OFF (ie door interlock. remote frost etc).
For Master/Slave networks, remote OFF can be set for individual zones or total system via the Master.
If individual BMS ON/OFF on master/slaves systems are required, set all SmartCom programs to 24 hour and use normally closed contacts across B0 and B2. Set engineers variable.

REMOTE SENSOR(s) may be placed at a max distance of 100m from the control unit, using screened 0.75mm² cable.
Wiring should be kept separate from mains wiring to minimise noise pick up. Set within Engineers functions for remote sensor.

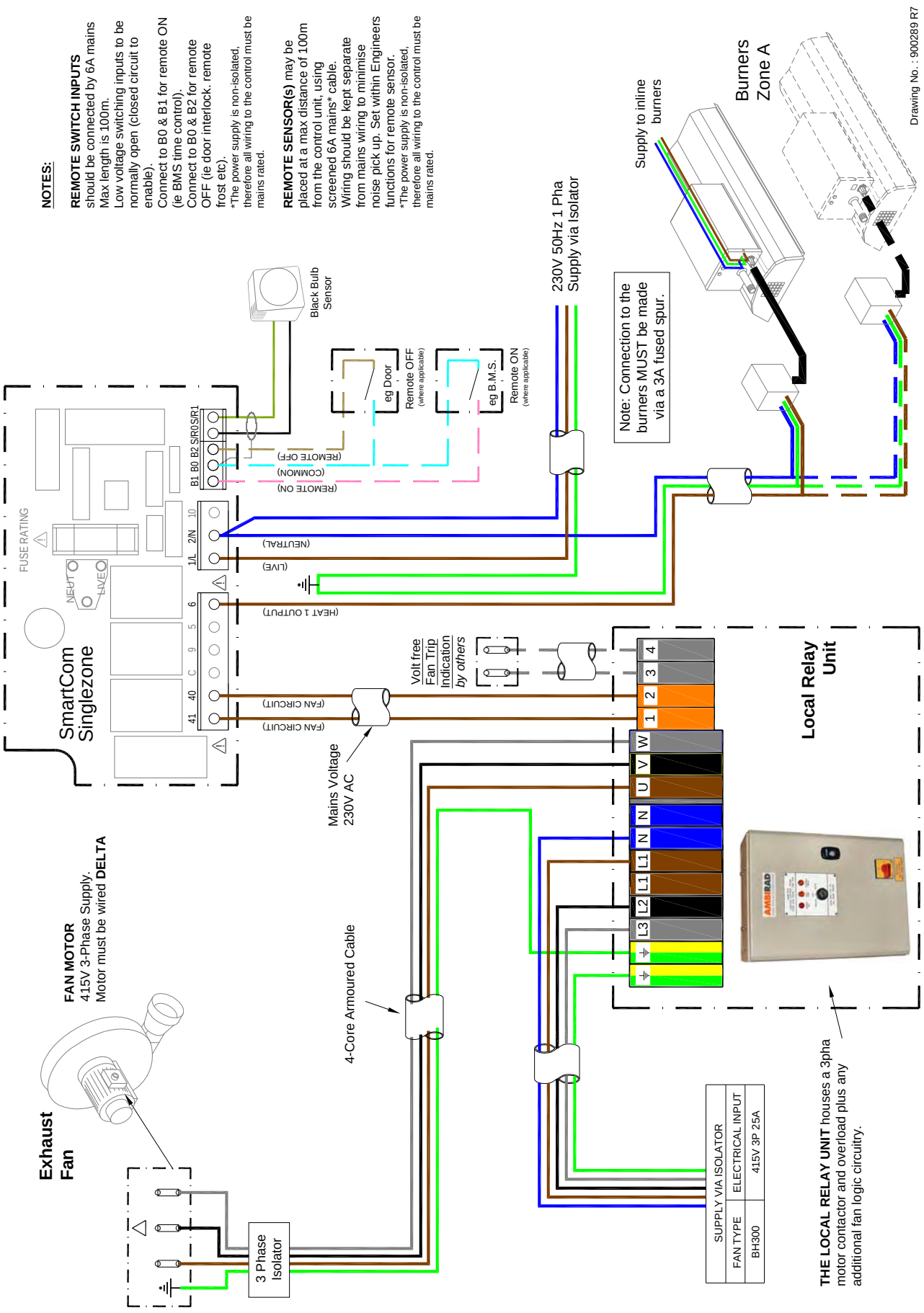
THE LOCAL RELAY UNIT houses an inverter. This converts the 230V single-phase input into a three-phase 230V output. The inverter provides a soft start to the motor, which extends the motor life by minimising the start current.



SUPPLY VIA ISOLATOR	
FAN TYPE	ELECTRICAL INPUT
B80	230V 1P 22A
B160	230V 1P 22A
B300	230V 1P 30A

Drawing No.: 900288 R5

3 Single Zone BH300 Fan System.


NOTES:
REMOTE SWITCH INPUTS should be connected by 6A mains Max length is 100m. Low voltage switching inputs to be normally open (closed circuit to enable). Connect to B0 & B1 for remote ON (ie BMS time control). Connect to B0 & B2 for remote OFF (ie door interlock. remote frost etc). *The power supply is non-isolated, therefore all wiring to the control must be mains rated.
REMOTE SENSOR(S) may be placed at a max distance of 100m from the control unit, using screened 6A mains* cable. Wiring should be kept separate from mains wiring to minimise noise pick up. Set within Engineers functions for remote sensor. *The power supply is non-isolated, therefore all wiring to the control must be mains rated.
Drawing No. : 900289 R7
Burners Zone A
Supply to inline burners
Black Bulb Sensor
230V 50Hz 1 Pha Supply via Isolator
Note: Connection to the burners MUST be made via a 3A fused spur.
eg Door
Remote OFF (where applicable)
eg B.M.S.
Remote ON (where applicable)
SmartCom Singlezone
FUSE RATING
NEUT
LIVE
B1 B0 B2 S/R0S/R1
(REMOTE OFF)
(COMMON)
(REMOTE ON)
1/L 2/N 10
(NEUTRAL)
(LIVE)
6
(HEAT 1 OUTPUT)
41 40 C 9 5
(FAN CIRCUIT)
(FAN CIRCUIT)
Volt free Fan Trip Indication by others
Mains Voltage 230V AC
Local Relay Unit
4 3 2 1 W V U N N L1 L1 L2 L3
4-Core Armoured Cable
FAN MOTOR
415V 3-Phase Supply.
Motor must be wired DELTA
Exhaust Fan
3 Phase Isolator
SUPPLY VIA ISOLATOR
FAN TYPE
ELECTRICAL INPUT
BH300
415V 3P 25A
THE LOCAL RELAY UNIT houses a 3pha motor contactor and overload plus any additional fan logic circuitry.

NOTES:

Controls cables min 0.75mm² cable for up to a distance of 200m.

NETWORK. Master-slave (Network) communication is by screened twisted pair cable, RS485 compatible such as Belden 9841. Maximum overall system length of 500m. Connect screen to C0. NOTE: Diagram shows a master and ONE slave configuration**. Wire further slaves in parallel.

REMOTE SWITCH INPUTS should be connected by 0.75mm² cable. Max length is 100m.
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Connect to B0 & B1 for remote ON (ie BMS time control).
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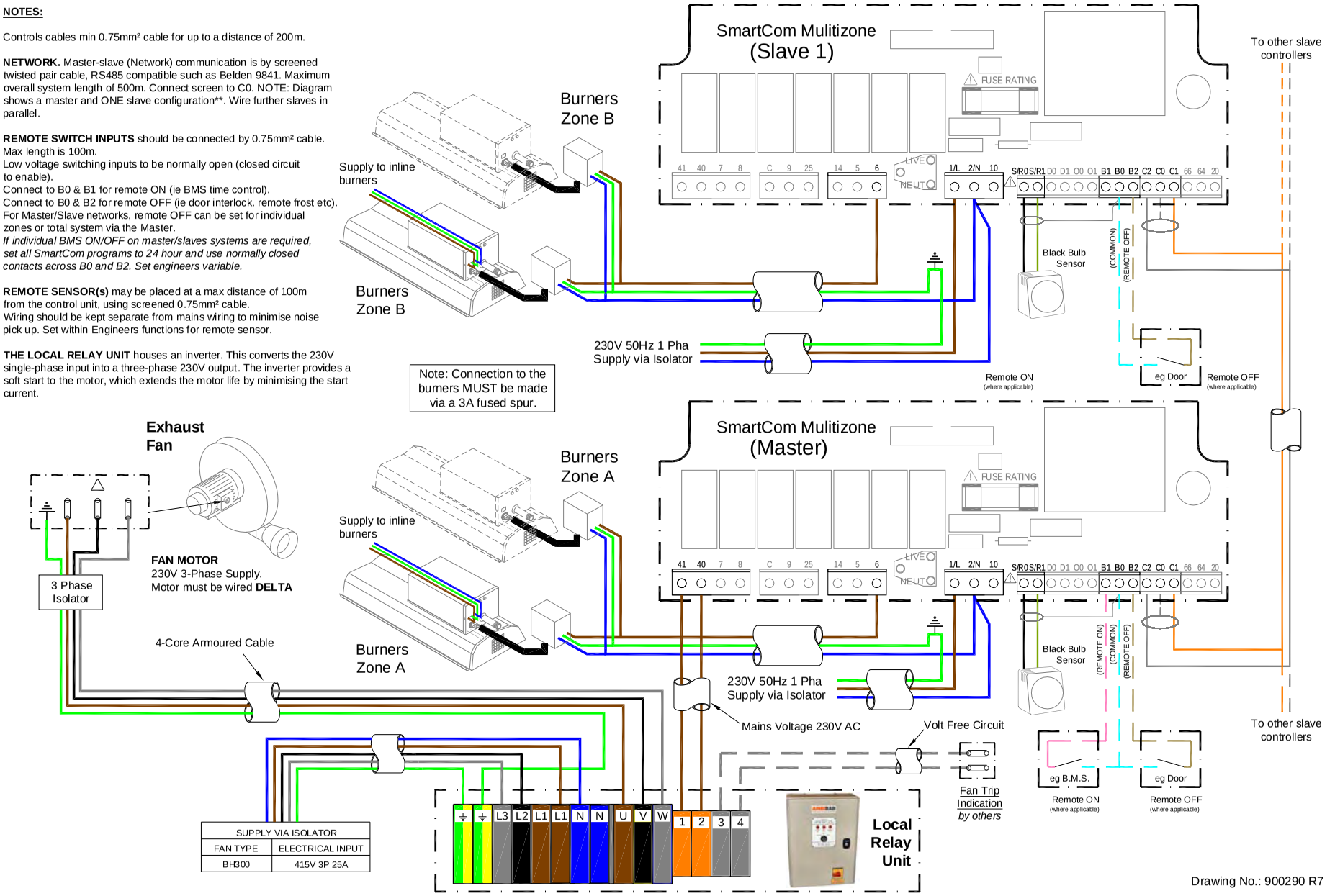
For Master/Slave networks, remote OFF can be set for individual zones or total system via the Master.
If individual BMS ON/OFF on master/slaves systems are required, set all SmartCom programs to 24 hour and use normally closed contacts across B0 and B2. Set engineers variable.

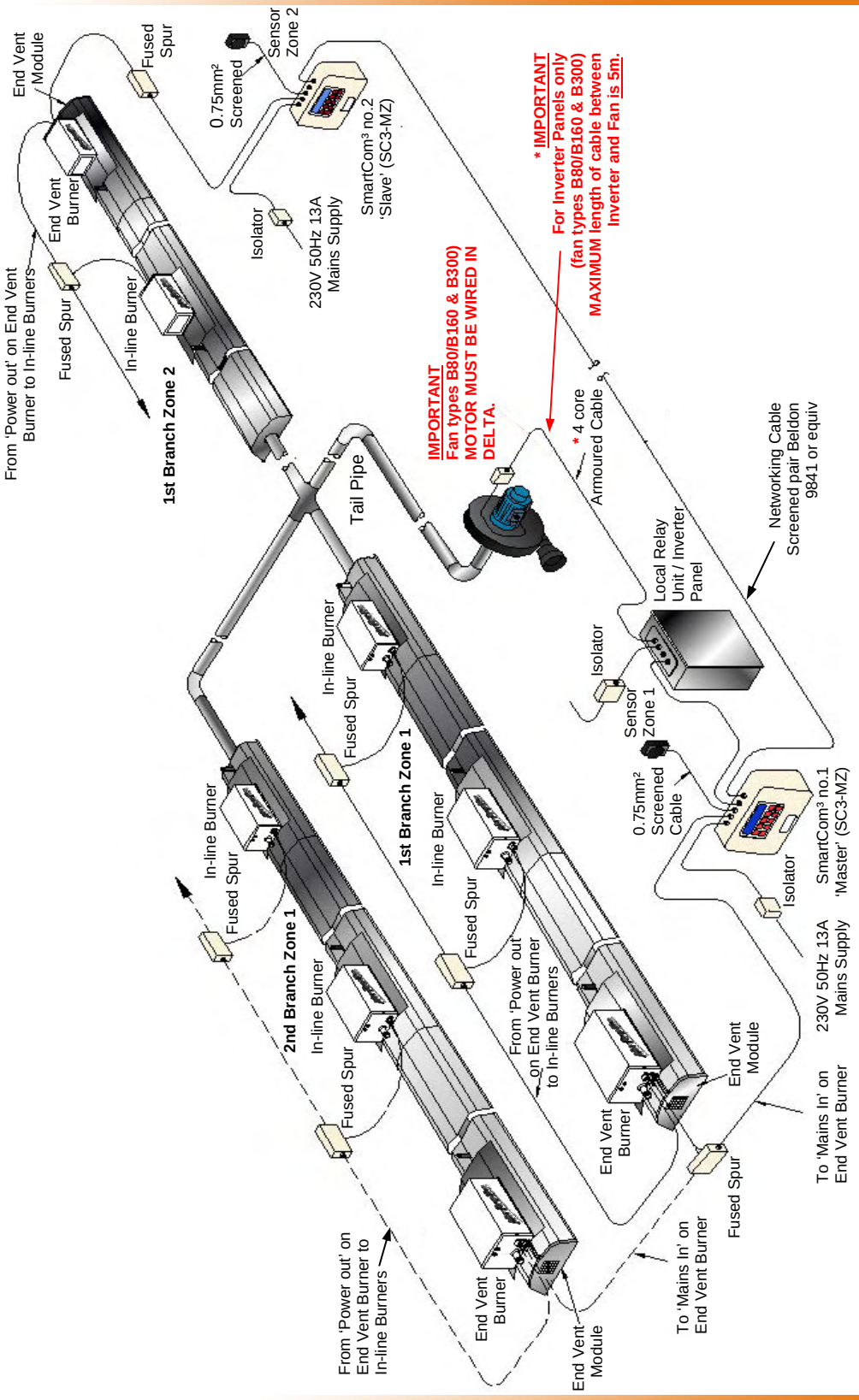
REMOTE SENSOR(s) may be placed at a max distance of 100m from the control unit, using screened 0.75mm² cable.
Wiring should be kept separate from mains wiring to minimise noise pick up. Set within Engineers functions for remote sensor.

THE LOCAL RELAY UNIT houses an inverter. This converts the 230V single-phase input into a three-phase 230V output. The inverter provides a soft start to the motor, which extends the motor life by minimising the start current.



Drawing No.: 900290 R7

5 Schematic Nor-Ray-Vac Multizone System.


End Vent Module
Fused Spur
0.75mm² Screened
Sensor Zone 2
SmartCom³ no.2 'Slave' (SC3-MZ)
End Vent Burner
Isolator
230V 50Hz 13A Mains Supply
From 'Power out' on End Vent Burner to In-line Burners
Fused Spur
In-line Burner
1st Branch Zone 2
* IMPORTANT For Inverter Panels only (fan types B80/B160 & B300) MAXIMUM length of cable between Inverter and Fan is 5m.
IMPORTANT Fan types B80/B160 & B300) MOTOR MUST BE WIRED IN DELTA.
Tail Pipe
* 4 core Armoured Cable
Networking Cable Screened pair Beldon 9841 or equiv
Local Relay Unit / Inverter Panel
In-line Burner
Fused Spur
1st Branch Zone 1
Isolator
Sensor Zone 1
0.75mm² Screened Cable
SmartCom³ no.1 'Master' (SC3-MZ)
2nd Branch Zone 1
From 'Power out' on End Vent Burner to In-line Burners
End Vent Burner
End Vent Module
To 'Mains In' on End Vent Burner
Fused Spur
To 'Mains In' on End Vent Burner
230V 50Hz 13A Mains Supply

6 SmartCom³ Commissioning.

For ease and swiftness of initial start-up, the SmartCom³ range of electronic controllers is supplied factory pre-set to operate a standard **warm air unit** heater. To operate with a Nor-Ray-Vac system however, the parameters will have to be changed via the engineers settings.

Follow the step by step instructions overleaf for the correct settings. For more detailed instructions and other engineer settings, refer to the SmartCom³ user manual GB/SCOM/120/0309.

In order to access the engineer functions:

Press and hold in the PLUS button and at the same time, press the SETTINGS button.

			CONTROL TYPE WARM AIR SET/OK	press	OK	to alter or press	SETTINGS	to advance
press	PLUS	once.	CONTROL TYPE RADIANT SET/OK	press	OK	to accept. Press	SETTINGS	to advance
			RAD/NRV/HB SPLIT OFF SET/OK	press	OK	to alter or press	SETTINGS	to advance
press	PLUS	once for split zonal systems	RAD/NRV/HB SPLIT ON SET/OK	press	OK	to accept. Press	SETTINGS	to advance
press	PLUS		INTERNAL SENSOR ON SET/OK	press	OK	to alter or press	SETTINGS	to advance
press	PLUS	once to turn off internal	INTERNAL SENSOR OFF SET/OK	press	OK	to accept. Press	SETTINGS	to advance
			EXTERNAL SENSOR OFF SET/OK	press	OK	to alter or press	SETTINGS	to advance
press	PLUS	once to turn off external	EXTERNAL SENSOR ON SET/OK	press	OK	to accept. Press	SETTINGS	to advance
			NETWORKING OFF SET/OK	press	OK	to alter or press	SETTINGS	to advance
press	PLUS	once for master slave	NETWORKING ON SET/OK	press	OK	to accept. Press	SETTINGS	to advance
			MASTER UNIT OFF SET/OK	press	OK	to alter or press	SETTINGS	to advance
press	PLUS	once if master unit	MASTER UNIT ON SET/OK	press	OK	to accept. Press	SETTINGS	to advance
			SLAVE UNIT 0 SET/OK	press	OK	to alter or press	SETTINGS	to advance
press	PLUS	for unique slave number	SLAVE UNIT 3 SET/OK	press	OK	to accept. Press	SETTINGS	to advance
			SLAVE TOTAL 0 SET/OK	press	OK	to alter or press	SETTINGS	to advance
press	PLUS	for total no. of slaves	SLAVE TOTAL 6 SET/OK	press	OK	to accept. Press	SETTINGS	to advance

MASTER & SLAVE (NETWORK)

When setting up a SmartCom³ Master and Slave (Network) system, the master controller will display an error message during commissioning. This will clear once the commissioning is complete.

REMOTE SWITCHED INPUTS

SmartCom³ controllers can be operated remotely via a remote ON or a remote OFF signal in the following ways:

A. **Building Management System Control (BMS).**

SmartCom³ controllers can be operated via a BMS system, by applying a volt free connection (ie closed circuit to enable) across terminals B1 and B0 turns the system on. Making this connection on a master controller will turn the entire system on whereas making this connection on a slave unit will only bring on that zone.

1. BMS controlling time only.
Ensure all the programmed ON times in the SmartCom² are turned off
(i.e. They read "- -:- -").

2. BMS controlling time and temperature.
Ensure all the programmed ON times in the SmartCom² are turned off
(i.e. They read "- -:- -"). Set all the required day temperatures to 30°C.

B. Remote door interlock. SmartCom³ controllers can be connected to a door interlock, remote frost stat or permanent off switch via terminals B2 and B0. When a volt free connection is provided (ie closed circuit to enable) at these terminals, the controller reverts to FROST ONLY mode. Refer to the individual wiring diagrams for wiring configurations and type.

7 End Vent Suction Setting Procedure.

The use of an inverter on the B80, B160, B300 fan system allows the end vent suction to be adjusted by varying the fan speed.

The description for adjusting the fan speed is given in the following section. Apart from this change the commissioning section in the manual should be followed.

End vent suction (B80, B160, B300)

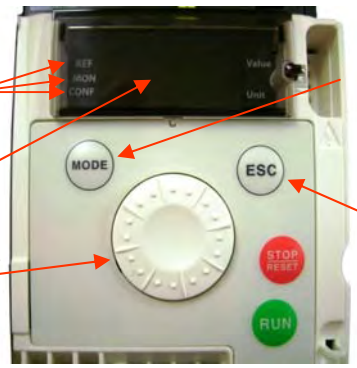
For these systems the end vent suction is adjusted by altering the low speed setting of the inverter within the local relay unit.

1. Check that the fan damper is fully open and secure.
2. Ensure the SmartCom³ is in a programmed ON time.
3. Set the required room temperature above the actual room temperature.
4. After a 30s delay the fan should run.
5. The fan should now be running and the inverter should be showing the motor frequency in the display.
6. Check for correct rotation of fan.
7. Press the mode button 3 times until 'COnF' appears on the display.
8. Press the jog dial to enter. Rotate jog dial until 'LSP' is displayed. Press jog dial to enter. Rotate jog dial to adjust frequency. Press jog dial to enter new value, causing the inverter to change its speed. Adjust the frequency until the appropriate end vent suction is achieved, this is given in the table below.
9. Pressing the ESC button twice will return the inverter to the 'rdY' display. The setting procedure is now complete.

System	End vent pressure mbar
Standard systems	6.25
Single 32LR End vent only	7.5
Single 38LR End vent only	8.25
Single 46LR End vent only	9.25
Three 46LR in a single branch	5.6

End vent suction (BH300 ONLY)
This unit does not feature an inverter, the end vent suction adjustment is made using the fan damper, details of this are given in the Nor-Ray-Vac manual.

The inverter interface (door open)



The local relay unit

An AmbiRad Group brand

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ENERGY EFFICIENT HEATING SYSTEMS

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